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ABSTRACT

Presented at a rural health care research forum held in conjunction with the American Medical Association's annual Conference on Rural Health (March 1975), the papers in this publication reflect the forum's focus upon assessment of recent research relative to rural health care delivery and the need for researcher communication and interchange. A participant roster is presented and identifies forum participants as including researchers and administrators from the departments of agricultural economics and rural sociology in the colleges of agriculture, departments of community medicine and family practice in the colleges of medicine, the U.S. Department of Agriculture (USDA) research and action agencies, and private firms doing rural health care delivery research, as well as practicing rural and other physicians. The three papers presented in this publication are written by representatives from colleges of agriculture and medicine and the USDA and are titled as follows: (1) "Assessment of Current and Recent Research on Rural Health Care Delivery by Colleges of Agriculture"; (2) "Rural Health Care Research: Past Accomplishments and Future Challenges"; (3) "Assessment of Knowledge of Rural Health: Knowledge Needs and Methods". (JC)

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RURAL HEALTH CARE RESEARCH FORUM

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Roanoke, Virginia
March 19, 1975

RC009544

Sponsored by Farm Foundation and AMA Council on Rural Health

RURAL HEALTH CARE DELIVERY RESEARCH FORUM

The Farm Foundation and the Rural Health Council of the American Medical Association cooperated in holding a rural health care research forum in March of 1975 in conjunction with the AMA's annual Conference on Rural Health. The purpose of the forum was to assess recent research on rural health care delivery and to provide interchange among researchers who usually have little communication with one another. Approximately forty people participated, including researchers and administrators from the departments of agricultural economics and rural sociology in the colleges of agriculture, departments of community medicine and family practice in the colleges of medicine, U. S. Department of Agriculture research and action agencies, and private firms doing rural health care delivery research, as well as practicing rural physicians.

The papers in this publication were presented at the forum. They were prepared by researchers from a college of agriculture, a college of medicine, and the U. S. Department of Agriculture. One result of the forum was a clearer definition of rural health care research problems. The discussions also pointed up the need for developing collaboration between disciplines as well as coordination of research activities between the colleges of agriculture and the colleges of medicine.

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Assessment of Knowledge of Rural Health: Knowledge Needs and Methods

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Office of Planning and Evaluation
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Roster of Participants

ASSESSMENT OF CURRENT AND RECENT RESEARCH ON RURAL HEALTH CARE DELIVERY BY COLLEGES OF AGRICULTURE AND THE USDA

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Presented at the Rural Health Care Research Forum, Roanoke, VA, March 19, 1975.

ASSESSMENT OF CURRENT AND RECENT RESEARCH ON RURAL HEALTH CARE DELIVERY BY COLLEGES OF AGRICULTURE AND THE USDA

When Jim Hildreth contacted me in regard to preparing this paper he emphasized that an "assessment" was more than a listing of research projects. He said he was interested in (1) what is left out and (2) where is the coverage weak. I will attempt to make such an assessment. The paper is divided into two major sections. The first section is the heart of the actual assessment while the second section highlights certain organizational and institutional considerations that can strengthen our research efforts.

One of the areas I will not address--at least not directly--is the extent to which colleges of agriculture and the USDA should be involved in research on rural health care delivery. Recommendations in this area get into the whole issue of resource allocation and priority setting within these two institutions. This issue is largely beyond the scope of this paper and I see no need to add my casual opinions to the well-researched work of others (for example, see references 1-4). Instead, I will simply assume that colleges of agriculture and the USDA will be involved to some extent in the future, as they have been in the past, on researching the problems of rural health care delivery.

Before turning to my assessment allow me to briefly retreat and raise the question: Is there anything unique about delivering health services to residents in rural areas? In other words, why don't we research health care delivery, in general, rather than have a subset of activity called rural health care research? The usual response to this

question is to dust-off the statistics on age, income, occupation, etc. I believe this response is inadequate.

To recognize rural-urban differences in socioeconomic factors does not mean different ways of organizing and delivering health care are needed. At most it means that the total bundle of health services needed will have a slightly different "mix". For example, the greater proportion of elderly in rural areas simply means a greater percentage of rural health care services should be of a geriatric nature. As another example, rural areas have a greater percentage of low-income persons. The health care needs of this group and the barriers they face in securing services are great, but I submit that the income factor, per se, does not create a very different set of problems for the rural poor than for the urban poor. In fact, the only special population I can think of in rural areas that creates special health care delivery problems and that doesn't have an urban counterpart is the migrant worker. This worker is constantly on the move and this mobility in and of itself creates peculiar delivery problems.

With the notable exception of migrant workers, I believe the key difference between organizing for health care delivery in rural and urban areas is not due to socioeconomic differences between the rural and urban population. Instead, the difference is where these populations live. Rural persons typically live in small communities or in the open countryside and at a considerable distance from larger population centers. The special problems created in delivering services due to this type of settlement pattern are problems of availability, accessibility,* and choice.

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*Availability refers to whether or not services exist while accessibility refers to the ease by which existing services can actually be used.

I submit that in most urban areas--even in the inner city--the availability of health care is not really an issue. In many rural areas even the most basic health care simply does not exist. For example, in 1973, 138 counties, almost all of which we would classify as rural, were without a physician. The 487,200 persons living in these counties were scattered over 148,000 square miles [5]. Many of these counties probably lacked a population base large enough to support a privately practicing physician. Those counties that did have an adequate population base were apparently unattractive for other reasons. Physicians, like other professionals, are not likely to trek into the hinterlands away from professional support facilities and colleagual interaction even if the financial remuneration is adequate. In rural areas, specialized services vis-à-vis basic or primary care services are even more difficult to make available. For example, South Dakota does not have a single neurological surgeon. Wyoming has one and Idaho and North Dakota each have two. San Francisco has 32 [6].

Accessibility is a problem in both rural and urban areas but not necessarily for the same reasons. Most problems of accessibility in urban areas stem directly or indirectly from racial discrimination, low income, and service hours that do not mesh with the consumer's schedule. These factors are also operational in rural areas but are supplemented by the problem of distance. For example, a white millionaire who suffers a cardiac arrest at noon in the middle of Owyhee County, Idaho is not likely to be any better off than a black pauper who suffers a similar misfortune at midnight. Owyhee County is one of those 138 counties without a physician and has a land area of approximately 8,000 square miles. To the extent physical inaccessibility within a reasonable time

period also exists in urban areas it is likely to be due to traffic congestion rather than sheer distance.

Finally, many and perhaps most rural residents face a rather limited choice of alternatives when receiving health care services. A common situation in rural areas is a small community with one or two physicians and a single hospital. This monopoly situation can have serious implications for the cost and quality of care received by rural residents.

To summarize--in most cases health care services in rural areas would not have to be delivered any differently than in urban areas if it were not for the fact that rural people typically live in small communities or in the open countryside, and at some distance from large population centers. This residential pattern creates special problems of availability, accessibility, and choice and also justifies a subset of research activity dealing specifically with rural health care delivery.

THE ASSESSMENT

Methodology

In 1974, Control Data Corporation (CDC) was asked by the USDA to obtain an in-depth assessment of the state of research and knowledge about rural health services. In pursuing their assignment, CDC availed themselves of several research information systems. When I learned of this aspect of their work I asked CDC if it would be possible for them to isolate for me research recently completed or currently underway in colleges of agriculture and within the USDA. The CDC personnel were most cooperative and subsequently sent me a list of 86 research projects in colleges of agriculture and within the USDA that appeared to focus, at least in part, on problems related to rural health care delivery. On

the basis of project titles, six projects were clearly irrelevant to the task at hand and were not given further consideration. Dr. Edward Moe, Principal Sociologist for the Cooperative State Research Service, then provided informational printouts on the remaining 80 projects identified by CDC. These informational printouts were from the Current Research Information Service (CRIS).

Most of us who have worked with research information systems are aware they are not infallible. Two types of problems occur. First, the system's brief informational printouts sometimes include sins of omission and/or sins of commission. In order to help minimize this problem I contacted by mail the project leader(s) of 76 of the 80 projects identified by CDC.* In this letter I asked the project leader(s) for (1) a copy of the project proposal and an update or clarification if they felt the project had been modified vis-à-vis the original proposal and (2) any publications or research reports resulting from the project. In addition, I inquired about additional rural health care research recently completed or currently underway and also asked for the names of other researchers within their college of agriculture (or the USDA) who were engaged in this research area. Finally, I asked for their opinion(s) on where past and current research on rural health care delivery had been weak and what directions should be taken to strengthen these research efforts. Some type of response was forthcoming on approximately two-thirds of the projects about which I inquired.

A second problem with research information systems is that they do not always "flag" all projects that may be of interest to the researchers. This is why I asked the project leader(s) to identify additional research recently completed or currently underway within their

*I was intimately acquainted with 4 of the projects.

college of agriculture (or the USDA). Fourteen additional research projects were uncovered on the basis of responses to this question. As another step, I contacted the Director of the Agricultural Experiment Station or his equivalent at those 32 agricultural institutions having no projects listed according to the CDC inventory. In this letter I inquired about the accuracy of my tentative finding that no research on rural health care delivery was underway in their college of agriculture. Officials at 18 of the 32 institutions responded and in all but five cases I was assured that the CDC inventory was correct. The project director(s) of these five projects and the fourteen "missing" projects previously mentioned were contacted for additional information.

Based on CRIS printouts and correspondence with the researchers it was clear that not all of the 99 projects identified were really appropriate for my assessment. Some projects had never been implemented, others were not even remotely related to rural health care delivery, and some were only superficially addressed to researching rural health care delivery. Examples of the latter were projects that happened to compile a few descriptive statistics on doctors or hospitals while researching a theme unrelated to rural health care delivery. Twenty-five of the ninety-nine projects were dropped for one of these three reasons. The remaining 74 projects were not necessarily devoted entirely to rural health care delivery. In fact, most were "umbrella" projects which also included research in other areas such as education, housing, or welfare. However, in my judgment, at least some research beyond the extremely superficial level appears underway or has been completed in each of these 74 projects.

In addition to reviewing projects, I also made a quick library search. I uncovered eleven recent (since 1969) research publications

(or papers) that apparently involved USDA or college of agriculture funding but which did not seem to be related to any of the 74 projects. These 74 projects and 11 publications are the basis for my assessment of recent and current research on rural health care delivery in colleges of agriculture and the USDA.*

The Analysis

In all but ten states research on rural health care delivery is currently underway or has recently been completed by college of agriculture or USDA researchers. These states are Alabama, Alaska, Arizona, Delaware, Georgia, Hawaii, Idaho, Illinois, Rhode Island, and South Carolina. This may be an interesting fact but it does not do justice to the questions of what is left out and where is the coverage weak.

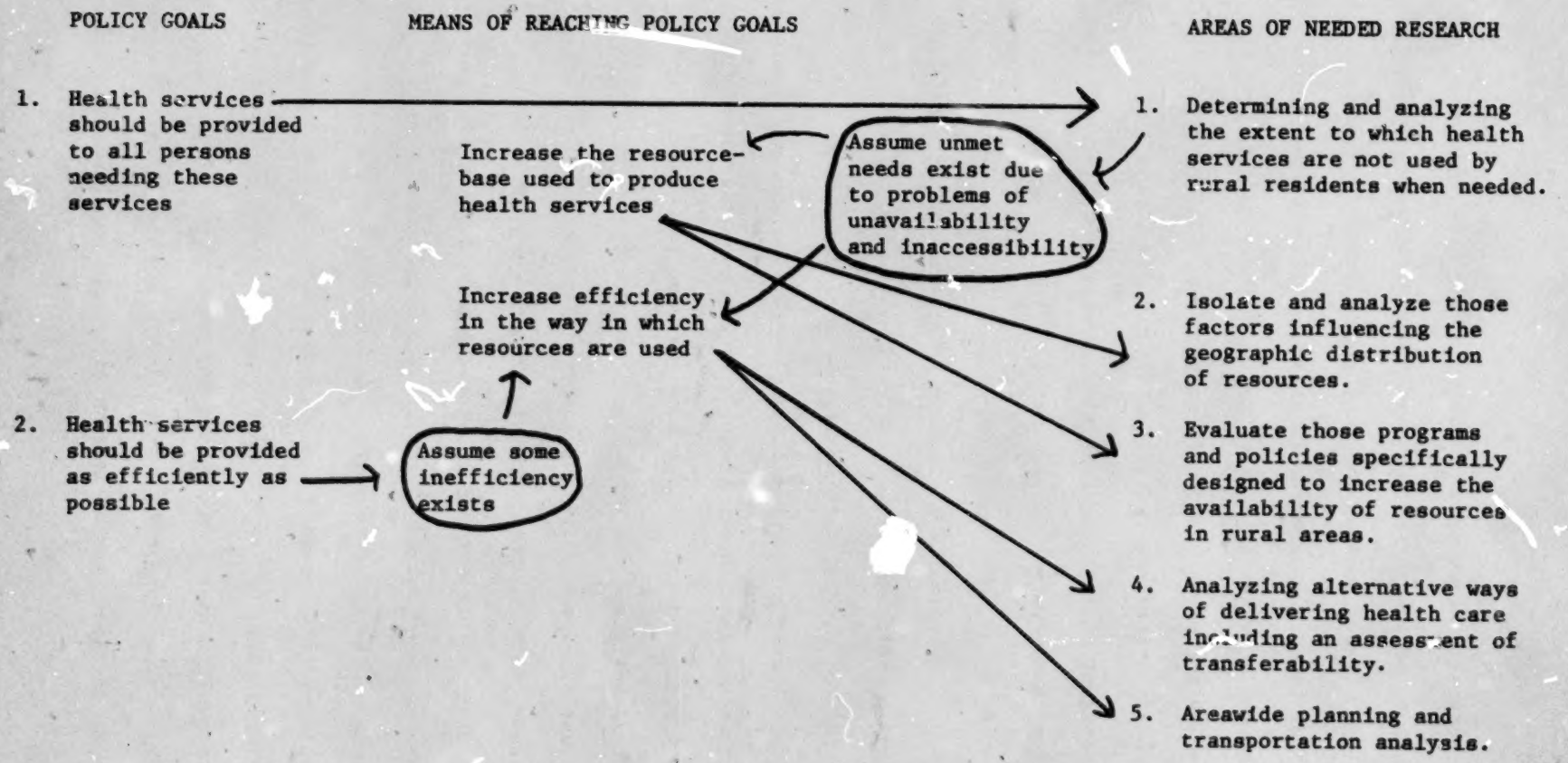
In order to answer such difficult questions some notion of what should be covered is needed. This calls for a general research model or conceptual paradigm. The paradigm I have developed (see Figure 1) begins with the statement of two policy goals:

1. Health services should be provided to all persons needing these services.
2. Health services should be provided as efficiently as possible.

The first policy goal is an "equity" or "justice" statement based on the premise that health services (or at least a minimum set of services) are a basic human right rather than a privilege to be rationed on the basis of ability to pay or some other factor. This premise is supported by politicians of every persuasion, the American Medical Association,

*See Appendix for a listing of projects and publications.

Figure 1. A Paradigm of Research on Rural Health Care Delivery


POLICY GOALS
MEANS OF REACHING POLICY GOALS
AREAS OF NEEDED RESEARCH
1. Health services should be provided to all persons needing these services
2. Health services should be provided as efficiently as possible
Increase the resource-base used to produce health services
Increase efficiency in the way in which resources are used
Assume unmet needs exist due to problems of unavailability and inaccessibility
Assume some inefficiency exists
1. Determining and analyzing the extent to which health services are not used by rural residents when needed.
2. Isolate and analyze those factors influencing the geographic distribution of resources.
3. Evaluate those programs and policies specifically designed to increase the availability of resources in rural areas.
4. Analyzing alternative ways of delivering health care including an assessment of transferability.
5. Areawide planning and transportation analysis.

practically every major labor union and consumer group, and has had the support of every President since Franklin Roosevelt.

The second policy goal also has near unanimous support. Keeping these two goals separate is simply a matter of convenience. This separation allows the researcher to study the efficiency of health care delivery regardless of who is receiving the services, and/or to determine who is receiving services regardless of how efficiently they are being delivered. I suggest in Figure 1 that five major research areas logically follow from these two policy statements. I will elaborate on this logic a bit later.

The crux of my assessment strategy was to place the 74 projects and/or their associated publications plus the 11 publications not attributed to projects into at least one of these areas. As can be seen in Table 1 only a few projects and/or publications fell outside these five areas and into "Other Areas." Double counting was avoided. For example, a project and its publications were not both categorized if the publications reflected the entire scope of the project. On the other hand, in those cases where the publication(s) reflected only part of the project's scope, both the publication(s) and the project were categorized. In such a case the project was categorized according to that portion of the project not covered by the project's publication(s).

The first research area--determining and analyzing the extent to which health services are not used by rural residents when needed--simply calls for an empirical measure of the equity goal. Thirty projects or publications focus on the use of services by rural residents (Table 1). This is more projects and publications than in any other research area. Most of these studies attempt to answer such questions as how often do

Table 1. Categorization of College of Agriculture and USDA Projects and Publications Relating to Rural Health Care Delivery

Research Area	Code Number of Projects and Publications*
Determine and analyze the extent to which health services are not used by rural residents when needed.	P2, P4, P7, P11, P12, P14, P18, P19, P26a, P27, P28, P36a, P36b, P41a, P43, P44, P45a, P46, P50a, P50b, P55, P56a, P63, P64a, P66, P68, P70, P72, P73a, P84
Isolate and analyze those factors influencing the geographic distribution of resources.	P3a, P9, P12, P13b, P18, P33a, P37, P47, P48, P49a, P56, P63, P70a, P77, P82
Evaluate those programs and policies specifically designed to increase the availability of resources in rural areas.	
Analyzing alternative ways of delivering health care, including an assessment of transferability.	P6, P8a, P12, P13a, P13b, P14, P18a, P30a, P32, P34a, P35, P42, P49a, P70a, P71, P74a, P76, P79, P81, P83
Areawide planning and transportation analysis.	P1a, P1b, P2, P5, P13c, P16, P17a, P19, P22a, P22b, P22c, P28, P31, P40, P41a, P49a, P52, P53, P54a, P59, P62, P63, P65, P67, P70b, P80, P85
Other Areas	
Health status assessment and analysis	P10, P15, P17, P20, P23a, P25, P39a, P51, P60, P61, P69
The relationship between health services and economic development	P18b, P29a, P73a, P75
Miscellaneous	P21, P24, P38, P57a, P58, P78

*See Appendix for more details on the projects and publications listed.

rural residents use services, how does this compare to those living in urban areas, and what factors influence utilization rates. Quite frankly, I see only limited utility in these studies in that they do not deal directly with the equity issue. For example, if we find out that rural persons use services less often than urban persons what do we conclude? Do we conclude that rural persons have fewer health service needs or do we assume they have greater needs but encounter more difficulty in having these needs met. As another example, some of these studies focus on distance traveled and find precisely what the naive observer would expect--rural residents generally travel further than urban residents to secure health services. Does this mean rural people have fewer of their needs met or that they simply travel further and incur more expense in having their needs met?

I suspect some sense can be made out of utilization studies if we simultaneously compare rural-urban utilization rates to rural-urban proxies of need such as morbidity rates. Few researchers have done this. Carlton and Mynko are exceptions [P11, P50b]. However, I submit that an even better approach is to ask rural residents two very simple questions:

1. Have there been times when you needed health services but were unable to obtain them?
2. If yes, why were you unable to obtain them?

These questions should be asked for a number of different health services (e.g., preventive, curative, emergency, and rehabilitative care). Studies by Hassinger and McNamara and Albrecht and Miller are among the very few that take this direct approach [P36b, P64a]. Implicit in this approach is the assumption that the consumer is the best judge of when services are needed. This seems a fair assumption in view of the consumerism and patient's rights movements.

If we find that rural residents are sometimes without needed services, problems of availability and/or accessibility likely exist. These problems can be reduced by (1) increasing the resource base used to produce health services (e.g., more doctors, hospitals, etc.) and/or (2) increasing efficiency in the way in which resources are used. Two major research areas flow from each of these strategies:

1. Isolating and analyzing those factors influencing the geographic distribution of resources.
2. Evaluating those programs and policies specifically designed to increase the availability of resources in rural areas.
3. Analyzing alternative ways of delivering health care, including an assessment of transferability.
4. Areawide planning and transportation analysis.

A modest amount of work has been done by researchers in colleges of agriculture and the USDA with respect to isolating and analyzing those factors influencing the geographic distribution of resources. Fifteen projects or publications were in this research area. Most of this research has been on why physicians locate where they do or why hospitals are located where they are. However, most of the cumulated knowledge in this area has been done by researchers outside colleges of agriculture and the USDA. For example, I have on file approximately 35 journal articles by these "outsiders" that deal only with the geographical distribution or locational decisions of physicians. I suspect this research area is of particular importance to policy-makers and those of us in colleges of agriculture and the USDA are very conspicuous by our relative absence.

One particular theme that might be insightful would be to study what we might call "exceptions." Three "exceptions" I happen to be

familiar with are Bradford and Montour Counties in Pennsylvania and Chelan County in Washington. All are rural counties but have major medical centers and a physician-population ratio much higher than in most major cities. I'm sure there are other anomalies of this type. Why do they exist?

We also need to examine the "rules of the game"--especially with respect to Federal resource allocation. What will be the effect of national health insurance on rural areas? DeVise argues that the impact of Medicaid, Medicare, and Federal grants to medical schools has widened the disparity between "physician-poor" and "physician-rich" states. He also argues that Federal subsidization of health maintenance organizations will further accelerate the disparity [7]. Is he correct? Only additional research can give us the answer.

A related research area is an evaluation of programs and policies specifically designed to increase the availability of resources in rural areas. Researchers in colleges of agriculture and the USDA have an even poorer track record in this area. Not a single one of the projects or publications I reviewed fell into this research area. I hope to change this situation by initiating research designed to isolate those factors affecting the retention rate of National Health Corps physicians, almost all of whom are serving rural communities. But what about some of the other programs? To my knowledge, researchers in colleges of agriculture and the USDA have not analyzed the Hill-Burton program--a program that has literally poured billions of dollars into rural areas for the construction of facilities. We have not looked at the impact on rural areas of the family practice specialty that is being so widely ballyhooed. We have not evaluated loan forgiveness programs--at least the only work in

this area with which I am familiar is being conducted by the National Health Council and by other researchers outside colleges of agriculture and the USDA [8, 9]. It was fellow panelist, Dr. Kane, another "outsider", who took charge of the excellent evaluation and analysis of the Sears Roebuck Medical Assistance Program--a program that helped 163 rural communities build clinics [10].

Another research area is the analysis of alternative ways of delivering health care to rural persons. I judge this research area to be of paramount importance, at least if we judge its importance by the number of different panaceas proposed for solving rural health problems. The amount of advocacy is incredible--group practice, primary medical care centers, satellite clinics, health maintenance organizations, health care foundations, health networks, mobile units, telecommunications, and physician assistants to name just a few of the solutions. What works and what doesn't and under what conditions? What is the relative efficiency of these various approaches? Efficiency is important in terms of increasing the supply of services available if excess need or demand exists but it is also important in providing any given quantity of services at the least possible cost. However, it is imperative that our criteria for evaluating alternative delivery systems be broader than strict economic efficiency as measured by cost per patient visit or cost per hospital bed. We also need to ask consumers and providers how satisfied they are with a particular delivery configuration.

In addition, we need to address ourselves to the problem of generalization and transferability. Just because a particular delivery system is a success in one community can it be emulated in others? Although transferability depends, at least in part, on resource availability the issue is much broader than that. For example, Cotton at

Mississippi State found that the leadership and organizational characteristics of communities influenced the manner and efficacy with which mental health clinics were established and operated [P34a]. As another example, it is my impression that most physicians are, at best, lukewarm to the concept of physician assistants. There is little question that they increase physician productivity and efficiency. Furthermore, McCoy's study indicates that most persons would readily accept care from such personnel [P81]. Legal liability is an alleged concern of physicians, but there must be more to it than that or stronger lobbying efforts for gaining protective legislation would be underway. I suspect sociologists may have much to offer in the area of diffusion and adoption of innovations. After all, analyzing the adoption of farm technology was rural sociologist's stock-in-trade for many years.

As implied earlier, the bag of tricks called institutional economics also needs to be dusted off. What happens when you change the rules of the game and the reward system? Economists in their great anxiety to find economies of scale typically forget about the reward or incentive system. A more important question than whether a 200-bed hospital is more efficient than a 150-bed unit may be whether a 200-bed proprietary hospital is more efficient than a 200-bed not-for-profit institution. Similarly, is competition important in guaranteeing the efficiency of a health maintenance organization (HMO)? If the answer is yes, we may as well forget the HMO alternative because no rural area is going to be able to support both a HMO and some other type of delivery system.

Twenty projects or publications fell into the area I have discussed at some length--analyzing alternative ways of delivering health care, including an assessment of transferability. This is such a wide-

open area that these few projects have barely scratched the surface. Almost all of the studies had a strict economic efficiency flavor. The economic analysis of hospitals and emergency medical care services seemed to be particularly popular themes.

The final research area stemming from my research paradigm calls for areawide planning and transportation analysis. Twenty-seven projects or publications fell into this research category. This area like the previous research area is also concerned with efficiency in resource usage but has more of a macro focus. What is the optimum location of hospitals? What is the effect on transportation costs of consolidating service systems in hopes of achieving economies of scale? Economists in the USDA and colleges of agriculture have been fairly active in researching these types of questions. A significant portion of the above-mentioned 27 projects and publications deal with location and transportation concerns. Increasing energy costs will increase the importance of this type of research. Some of this research has limited value because the models used consider facilities constructed to last 100 years as variable resources. For example, I doubt that policy-makers would find it very useful to learn that the Mayo Clinic should be located somewhere else. In other words, these studies must be of a prospective nature. Their real utility is to help areas plan for the spatial allocation of incremental adjustments in the resource base. An excellent example of this approach is the work by Hardy et al [P80].

Earlier in this paper I was fairly critical of "utilization analysis" as a way of measuring unmet need for health care. On the other hand, utilization analysis is an important input into planning and transportation models. Unfortunately, this analysis doesn't seem to be

finding its way into the hands of the model builder. This lack of research integration is extremely commonplace and even more regretful.

Twenty-one projects or publications did not fit into the five research areas associated with my paradigm. Over one-half of these dealt with health status assessment and analysis, e. g., surveys of farm accidents or assessing the effect of nutrition on "health." In my view, these issues are on the outer fringes of rural health care delivery research. This does not mean they are less important issues. Indeed, they are much more important concerns than health services if the policy goal is to increase longevity or decrease the infant mortality rate. Although health services probably have some impact on mortality their real value is in terms of psychological reassurance, decreased suffering, and some impact on morbidity. Society apparently places a high value on these considerations. If it did not it would have been inappropriate to begin this analysis with the premise that health services are a basic human right.

Four projects dealt with the relationship between health services and economic development. This is an important and interesting area, but it is also a research theme unrelated to the policy goals of efficiency and equity. If we shift gears and focus instead on a policy goal of rural economic development we can do some interesting speculation. This speculation should be replaced by research. How important are health services in selecting a place of residence? How important are they in the decision-making process of industrial location? How much increased labor productivity can be attributed to the existence of good health care? What is the potential for specialized health care services becoming an industrial base in rural areas (don't sneer--the Mayo Clinic is certainly the industrial base of Rochester, Minnesota)? These are questions which need answers.

ORGANIZATIONAL AND INSTITUTIONAL CONSIDERATIONS IN STRENGTHENING RESEARCH EFFORTS

A colleague of mine recently argued that:

> The land-grant system's mandate is to conduct practical and applied research, in the social as well as the natural sciences. The justification for our continued existence will depend on our ability to perform under the mandate. Performance is measured in the significance of problems researched, and the timeliness and the utility of the research product, not in budgets, personnel or publications. Researchers in colleges of agriculture eventually [produce] something more or less related to the original problem, but often capable only of interpretation by the scientist and a few bilingual laymen, and after the problem has long since been "solved." [11, p. 12.9]

Unfortunately, I must report that much of our research on rural health care delivery while methodologically sound, is neither significant in terms of the problems researched, timely, nor easily interpreted by nonacademicians. What we seem to have is a lot of bits and pieces of research (much of which is not policy-relevant) but with very little integration, coordination, or synthesizing of results.

Let me sketch out four reasons for this situation and some of the prerequisites for enhancing our research efforts. First, I believe it is important to have a "critical mass" of resources and intellectual investment to devote to research on rural health care delivery. I believe this critical mass currently exists or is rapidly developing in the USDA. Among colleges of agriculture I believe the same can be said for Michigan State, Ohio State, Purdue, the University of Minnesota, the University of Missouri and--if you will permit me to show my bias--at Penn State. I am sure there are other institutions with similar capabilities. Regional or multi-state research efforts can create a critical mass if it doesn't exist within a single institution.

What I sense happening all too often is that someone decides to do research on rural health care along with research on dairy marketing or rural housing and quickly throws together a project with such objectives as "To define rural health problems" or "To determine ways of improving rural health care delivery." Specifying such global objectives is sometimes part of the grantsmanship game but more frequently reflects naivette on the part of the researcher.

At the risk of sounding dramatic or pretentious let me say I think the delivery of health care is a very difficult area to research. A major problem is that there is no such thing as a theory of health care delivery to guide our thinking. This means we have to rely on the theories of our individual disciplines and all too often these theories leave much to be desired. For example, one of the limitations of economic theory is the fact no standardized product(s) or output(s) exists in the production process for health services. In addition, expecting maximum economic efficiency on the basis of a profit motive is irrelevant, by definition, in studying hospitals because of their nonprofit motives. Hence, while the technological potential for economies of scale likely exists, this potential will not necessarily be fully realized which will cause average costs to remain constant or decrease only slightly as hospitals increase in size. These types of "industry" peculiarities mean we have to make appropriate modifications in the theoretical tools we borrow from our disciplines. Such modifications come about only after becoming familiar with the peculiarities of health services and their delivery.

One of the most efficient and pleasurable ways of becoming familiar with these peculiarities is to spend time interacting with health

care providers. I suspect that operating from a college of agriculture base--especially in those land-grant universities without medical schools--places certain restrictions on this approach. If this is the case then the researcher must turn to secondary sources. A nice "set" of readings might include Who Shall Live?, Handbook of Medical Sociology, Health Care Politics, Health Services Research and R&D in Perspective, and Iowa State's soon-to-be published book on rural health care delivery [12-16].

A second suggestion is to strive for more interdisciplinary research. Again, the absence of a theory of health care delivery means each discipline can and should make its own unique contribution. However, these contributions will usually be of greater value if they are integrated into part of a larger multidisciplinary effort.

A third suggestion, and perhaps the most important of all, is to involve policy-makers in defining the research problem and thinking through research strategies. If I am correct in my hypothesis that much of our research is not policy-relevant I would attribute much of this failure to our lack of consultation with those who would make use of our research if it were of more value. These persons, who I loosely call policy-makers, are key elements in research planning if they do nothing more than continually ask the embarrassing question: "So what?" For example, if we confirm the hypothesis that older people use services more often than teenagers, so what?

I would also hope that a close working relationship with policy-makers would make some of our research more prospective or futuristic. With the exception of some of our transportation and planning analysis, almost all of our research is ex post facto. While retrospective analysis is an important part of an overall research strategy we are

completely over-committed in that direction. For example, national health insurance is sure to be a reality in the near future. After its implementation I wager that a host of researchers will be studying its impact on rural areas. But why isn't anyone predicting or even conjecturing about the differential impact of the various proposals on rural areas so residents in these areas can have some hand in shaping the legislation and/or in preparing for its impact?

The fourth and final problem is the reward system within which most of us operate. The real pay-off is for "original" research that is publishable in scholarly journals. This situation does not endear itself to the replication of previous studies nor the integration and synthesis of existing research. However, because of the dynamic nature of the health care delivery system a certain amount of replication is in order. For example, some persons believe too much research has already been done on the locational decisions of physicians. I disagree. Today's medical students are likely to be much different from yesterday's, including the obvious and dramatic differences in racial and sex make-up between current classes and classes of ten years ago. These differences may have significant implications for the location decision.

Integration and synthesis of existing research is also badly needed--not just for the researcher but also for the policy-maker. In this regard the Task Force on Rural Development in the Northeast noted:

> Research workers ordinarily do not regard this type of work as research and frequently neglect to do much of it even in preparation for their own projects. The need is for researchers to join with extension workers in comprehensive searches for information relevant to common rural development problems and to package it so that potential users can understand and apply it [3, p. 18].

A good example of this type of research is Favero's publication on capitation and group practice [P79]. While I heartily endorse the position taken by the above-mentioned Task Force, I am still waiting to see a "research chair" go to someone who has synthesized and integrated the empirical work of others. Furthermore, among "original" empirical work the premium is placed on rigor and elegance in model building. Of all the empirical pieces of work I reviewed, I would speculate that one of the most useful to local policy-makers is the study of rural ambulance services by Doeksen et al [P8a]. I will also speculate that because of the straight-forward analytical tools employed, the probability of this study being published in a "scholary" journal is somewhere between slim and none.

CONCLUDING COMMENTS

In terms of content, I believe our research focus at this point in time is much too heavily committed to consumer behavior or the demand and utilization side of rural health services. In my judgment, the real action and research needs are on the supply or provision side of rural health care delivery. This recommendation is reinforced by the findings of Willis at Massachusetts, who like several other researchers, have found that the single-most important factor influencing utilization is the existing supply of services [P28]. What I judge to be an overcommitment to the utilization side of services is probably due to (1) our ease and comfort with household surveys vis-à-vis working with the providers of health services and (2) the limitations of existing theory--at least in my own field of economics--in studying the provision of health services.

In my judgment most of the policy-relevant research on rural health care delivery has been done outside colleges of agriculture and

the USDA. What has been done within these two institutions has been fragmented and not additive. A comprehensive research paradigm is needed to keep our efforts integrated, meaningful, and additive. I have suggested such a paradigm. It probably needs additional work, but I believe the development of some type of paradigm is a worthwhile exercise for each of us. Our research efforts also suffer in many cases from the lack of sufficient intellectual investment in understanding the peculiarities of the health services and their delivery. This means a critical mass of research and intellectual investment is needed in our research projects. Insofar as possible this critical mass should have a multidisciplinary complexion. Finally, until policy-makers are involved in research activities and until our professional reward system recognizes the role of straight-forward analytic techniques and the importance of replicating certain studies and synthesizing and integrating the work of others, we cannot expect much improvement in the amount of policy-relevant research underway.

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APPENDIX

LISTING OF USDA PROJECTS AND ASSOCIATED PUBLICATIONS; LISTING OF COLLEGE OF AGRICULTURE PROJECTS AND ASSOCIATED PUBLICATIONS BY STATE; LISTING OF USDA AND COLLEGE OF AGRICULTURE PUBLICATIONS NOT ATTRIBUTED TO PROJECTS

USDA Projects and Associated Publications*

P1. Impact of Health Services, Education and Training and Welfare Programs on Economic Development. Robert I. Coltrane, USDA/ERS, Washington, DC 20250.

a. Efficiency in the Distribution and Utilization of Hospital Services: A Case Study in Rural Michigan by Neville Doherty, USDA, ERS-492, Nov. 1971.

b. "Hospital Sizes for Rural Areas When Patient Arrivals Are Poisson Distributed" by Clark Edwards and Neville Doherty, Agricultural Economics Research, Vol. 23, No. 4, October 1971, p. 101-104.

P2. Estimating Demand for Emergency Health Care Services and Determining Locations for Health Facilities in the Superior California Health Planning Region. Robert I. Coltrane and Stan Daberkow, USDA/ERS, Washington, DC 20250.

P3. Public Services and Finance in Growing and Declining Areas of the Lake States. Leon B. Perkinson, USDA/ERS, Dept. of Economics, North Carolina State University, Raleigh, NC 27607.

a. Health Service Differentials in Michigan by Leon B. Perkinson, Agricultural Economics Report No. 213, Feb. 1972.

P4. Expenditures of Rural Families for Health Services. Lucie G. Krassa, USDA, Agricultural Research Service, Federal Building, Hyattsville, MD 20782.

P5. The Health Status and Health Care Needs of the Rural Population. Jeanette Fitzwilliams, USDA/ERS, Washington, DC 20250.

P6. Comparison of Systems of Care for the Aged. Bernal L. Green, USDA/ERS, Dept. of Agricultural Economics and Rural Sociology, University of Arkansas, Fayetteville, AR 72701.

P7. Factors Influencing Hospital Usage in Arkansas. Bernal L. Green, USDA/ERS, Dept. of Agricultural Economics and Rural Sociology, University of Arkansas, Fayetteville, AR 72701.

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*Publications associated with projects are listed under the project and denoted by a lower-case letter.

P8. Economic Evaluation of Alternative Emergency Medical Services in the Great Plains. Bernal L. Green, USDA/ERS, Dept. of Agricultural Economics and Rural Sociology, University of Arkansas, Fayetteville, AR 72701.

a. "The Economics of Ambulance Service in Rural Oklahoma" by Gerald A. Doeksen, Jack Frye, and Bernal L. Green, Oklahoma Current Farm Economics, Agricultural Experiment Station, Oklahoma State University, Vol. 47, No. 4, Dec. 1974, p. 27-38.

P9. Economic and Regulatory Evaluation of Increasing the Supply of Physician Services in the Great Plains. Bernal L. Green, USDA/ERS, Dept. of Agricultural Economics and Rural Sociology, University of Arkansas, Fayetteville, AR 72701.

P10. Social Aspects of Aging in Appalachia. Grant Youmans, Dept. of Sociology, University of Kentucky, Lextington, KY 40506.

College of Agriculture Projects and Associated Publications--Alphabetized by State*

P11. Factors Affecting the Use of Medical Services in Rural Areas of Arkansas. J. L. Charlton, Dept. of Agricultural Economics and Rural Sociology, University of Arkansas, Fayetteville, AR 72701.

P12. The Economics of Health Care Delivery. John E. Kushmann, Dept. of Agricultural Economics, University of California, Davis, CA 95616.

P13. Institutional Structure for Improving Rural Community Services. T. Tjerslan, Dept. of Economics, Colorado State University, Fort Collins, CO 80521.

a. "Rural and Urban Colorado Hospital Costs" by R. D. Peterson and T. L. VanValey, Colorado Agricultural Roundup, Winter 1971-72, p. 15-18.

b. "Technology in Rural and Urban Colorado Hospitals, 1964-72" by R. D. Peterson, Colorado Agricultural Roundup, Summer 1973, p. 19-21.

c. Optimal Size, Number and Location of Hospitals in Rural Colorado to 1980--An Economic Model and Case Study by Robert M. Saywell, Ph.D. Dissertation, Dept. of Economics, Colorado State University, Fort Collins, CO 80521.

P14. Comprehensive Coordinated Personal Health Care Program. Director, Cooperative Extension Service, College of Agriculture, University of Connecticut, Storrs, CT 06268.

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*Publications associated with projects are listed under the project and denoted by a lower-case letter.

P15. Aging in Rural Connecticut. W. C. McKain and Howard R. Rosencranz, Dept. of Rural Sociology, University of Connecticut, Storrs, CT 06268.

P16. Community Services for Nonmetropolitan People in the Northeast. Arthur Dewey, Dept. of Agricultural Economics, University of Connecticut, Storrs, CT 06268.

P17. Planning and Financing Public Services for Rural Communities. E. T. Loehman and M. R. Langham, Food and Resource Economics, University of Florida, Gainesville, FL 32601.

a. "Areawide Planning for Optimum Location of Hospital Facilities for Rural People" by B. R. Eddleman, Southern Journal of Agricultural Economics, Vol. 4, No. 1, July 1972, p. 89-95.

P18. Social Indicators of Quality of Life. Ralph M. Brooks, J. R. Gordon, and Vern Ryan, Dept. of Agricultural Economics, Purdue University, West Lafayette, IN 47907.

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b. Preferences for Community Living: A Statewide Opinion of Indiana Residents by John Gordon, Brian Blake, Ralph Brooks, and Vern Ryan, EC-435, Cooperative Extension Service, Purdue University.

P19. Development of Efficient Public Service Delivery Systems for Iowa and the North Central Region. Robert W. Crown and Leo V. Mayer, Rural Development Center, Iowa State University, Ames, IA 50010.

P20. Adaptations to Aging in Small Towns. G. L. Bultena and E. A. Powers, Dept. of Sociology and Anthropology, Iowa State University, Ames, IA 50010.

P21. Family Life Education in Mental Health Centers in Kansas. C. E. Kennedy, Dept. of Home Economics, Kansas State University, Manhattan, KS 66504.

P22. Delineation of Medical Service Regions in Louisiana. Alvin L. Bertrand, Dept. of Sociology and Rural Sociology, Louisiana State University, Baton Rouge, LA 70803.

a. The Availability and Distribution of Health Personnel in Louisiana by Carl F. Baty, Virginia P. Steelman, and Alvin L. Bertrand, Bulletin No. 637, Agricultural Experiment Station, Louisiana State University, Aug. 1969.

b. Health Service Planning Regions for Louisiana by Carl F. Baty, Alvin L. Bertrand, Virginia P. Steelman, and Evans W. Curry, Bulletin No. 650, Agricultural Experiment Station, Louisiana State University, Jan. 1971.

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c. Demographic Factors, Medical Personnel and Facilities of Health Service Planning Regions for Economic: A Statistical Compendium for Planners by Evans W. Curry, Alvin L. Bertrand, Mary Z. Ferrell, and Virginia P. Steelman, Bulletin No. 658, Agricultural Experiment Station, Louisiana State University, Sept. 1971.

P23. Accidents on Farms in Louisiana: A Study of Their Incidence, Causes and Costs. Alvin L. Bertrand, Dept. of Sociology and Rural Sociology, Louisiana State University, Baton Rouge, LA 70803.

a. The Distribution and Characteristics of Farm Accidents in Louisiana by Karen W. Paterson, Joseph A. Novak, and Alvin L. Bertrand, Bulletin No. 665, Agricultural Experiment Station, Louisiana State University, Sept. 1972.

P24. A Study of Family Planning of Low-Income Families in Small Towns of Louisiana. K. Taj, Dept. of Home Economics, Southern University, Baton Rouge, LA 70813.

P25. Workmen's Compensation and Safety in Forestry, Arkansas and Louisiana. Dept. of Forestry, Louisiana Polytechnical Institute, Ruston, LA 71270.

P26. Community Services for Nonmetropolitan People in the Northeast. Louis A. Ploch, Dept. of Agricultural and Resource Economics, University of Maine, Orono, ME 04473.

a. A Study of Health Related Factors: Bucksport, Orland, Verona, Maine 1973, Miscellaneous Report 238, Dept. of Agricultural and Resource Economics, University of Maine, Apr. 1974.

P27. Community Services for Nonmetropolitan People in the Northeast. James Longest, Dept. of Agricultural Education and Extension, University of Maryland, College Park, MD 20742.

P28. Community Services for Nonmetropolitan People in the Northeast. Cleve E. Willis, E. Engel, E. K. Knapp, and B. C. Field, Food and Resource Economics, University of Massachusetts, Amherst, MA 01002.

P29. Health Care Delivery Systems as They Serve Rural People. Glenn L. Johnson, Dept. of Agricultural Economics, Michigan State University, East Lansing, MI 48823.

a. Health Care Industries in the Michigan Grand Traverse and Copper Country Regions: Case Studies in Community Resource Development by Neville Doherty, David Halkola, William Hanson, Shyamelendu Sarkar, and Glenn Johnson, Research Report 177, Agricultural Experiment Station, Michigan State University, Dec. 1972.

P30. Improved Community Management in Rural Michigan. Allan Schmid, Dept. of Agricultural Economics, Michigan State University, East Lansing, MI 48823.

a. A Comprehensive Rural Health Clinic: Case Study of Public Program Evaluation Methodology by Allan Schmid, Werner Kiene, and Gail Updegraff, Agricultural Economics Report No. 260, Dept. of Agricultural Economics, Michigan State University, Dec. 1973.

P31. Guidelines for Rural and Community Development in Economic Regions of Minnesota. William Easter, H. R. Jensen, and Robert Hoppe, Dept. of Agricultural and Applied Economics, University of Minnesota, St. Paul, MN 55101.

P32. Services Delivery Alternatives in Rural Development. William R. Maki, Dept. of Agricultural and Applied Economics, University of Minnesota, St. Paul, MN 55101.

P33. The Economics of Public Services in Nonmetropolitan Areas. Arley D. Waldo and J. D. Helmburger, Dept. of Agricultural and Applied Economics, University of Minnesota, St Paul, MN 55101.

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P34. Institutional Structures for Improving Rural Community Services. H. F. Kaufman and S. K. Reddy. Social Science Research Center. Mississippi State University, Mississippi State, MS 89762.

a. Some Intervening Factors Between Community Structure and Project Accomplishment: A Comparative Study of Projects Related to Mental Health by Gail Cotton, Master's Thesis, 1970, Dept. of Rural Sociology, Mississippi State University, Mississippi State, MS 89762.

P35. Alternative Medical Services Delivery Systems for Rural Areas in Mississippi. Fred H. Tyner, Agricultural Economics Department, Mississippi State University, Mississippi State, MS 89762.

P36. Health Organization and Behavior in Rural Society. Edward Hassinger and Daryl Hobbs, Dept. of Rural Sociology, University of Missouri, Columbia, MO 65201.

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P45. Institutional Structures for Improving Rural Community Services. Garrey E. Carruthers and Clyde Eastman, Dept. of Agricultural Economics, New Mexico State University, Las Cruces, NM 88003.

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P51. Rehabilitation and Adjustment Among Permanently Handicapped Persons Injured in Farm Accidents. Thomas T. Stout, Dept. of Agricultural Economics and Rural Sociology, Ohio State University, Columbus, OH 43210.

P52. Design and Criteria for Health Planning Systems. Dept. of Agricultural Economics, Oklahoma State University, Stillwater, OK 74074.

P53. Economic Analysis for Planning in the Oklahoma Health Sector. R. E. Just. Dept. of Agricultural Economics, Oklahoma State University, Stillwater, OK 74074.

P54. Institutional Structures for Improving Rural Community Services. Herbert Stoevener, Dept. of Agricultural Economics, Oregon State University, Corvallis, OR 97331.

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P55. Community Services for Nonmetropolitan People in the Northeast. Charles Crawford and Sam Cordes, Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

P56. Organization and Financing of Rural Community Services. Sam Cordes, Charles Crawford, and Sam Leadley, Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

a. Selected Family Characteristics Associated with Health Service Utilization in a Rural Central Pennsylvania Community by Donald E. Lifton, Master's Thesis, Mar. 1973, Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

P57. An Integration of Research and Extension Functions in Providing Health Education to Rural Pennsylvania. Sam Leadley, Charles Crawford, and Sam Cordes, Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

a. The Health Belief Model Applied to Two Preventive Health Behaviors Among Women in a Rural Pennsylvania County by Mary Hazen, Master's Thesis, Mar. 1975, Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

P58. Beliefs on the Existence of a Health Care Crisis as Related to National Health Insurance. R. Juarez, Charles Crawford, and Rex Warland. Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

P59. A Multivariate Analysis of the Health Care Sector of the Northeastern U. S. Michael Miller, Ken Wilkinson, and Rex Warland. Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

P60. Evaluation of the Congregate Meals Program in Pennsylvania. J. Patrick Madden and Sam Cordes. Dept. of Agricultural Economics and Rural Sociology, Penn State University, University Park, PA 16802.

P61. Study of Effectiveness (Outcome) of Nutrition Related Health Services of Knox County Health Department. D. W. Hubbard and M. R. Gram, College of Home Economics, University of Tennessee, Knoxville, TN 37916.

P62. Location of Central Public Facilities in Rural Areas. J. P. Miller, Dept. of Agricultural Economics, Texas A&M University, College Station, TX 77843.

P63. Health Care Delivery Services in Rural Texas. M. A. Soliman, Dept. of Economics and Geography, Prairie View A&M University, Prairie View, TX 77445.

P64. Institutional Structures for Improving Rural Community Services. Dept. of Sociology, Utah State University, Logan, UT 84321.

a. "Health Service Delivery: An Assessment of Some Adequacy Indicators" by Stan L. Albrecht and Michael K. Miller. Paper presented at the 1973 Meetings of the Rural Sociological Society, College Park, MD.

P65. The Socio-Economic Structure of Utah Rural Health Services, Director, Cooperative Extension Service, Utah State University, Logan, UT 84321.

P66. Community Services for Nonmetropolitan People in the Northeast. Robert Sinclair, Dept. of Agricultural Economics, University of Vermont, Burlington, VT 05401.

P67. Modeling to Increase Planning in Resource Allocation in Rural Medical Schools. Ben Forsyth, University of Vermont, Burlington, VT 05401.

P68. Perceived Health, Housing and Participation Needs of the Aged in Rural Virginia. J. N. Edwards and D. L. Klenmack, Dept. of Sociology, Virginia Polytechnical Institute, Blacksburg, VA 24061.

P69. Effects of Education and Food Programs Upon Health and Level of Living. Jane Wentworth and S. Farrier, Dept. of Human Nutrition and Foods, Virginia Polytechnical Institute, Blacksburg, VA 24061.

P70. The Availability and Economic Impact of Public Services in Rural Areas of Washington. Paul W. Barkley and David W. Holland, Dept. of Agricultural Economics, Washington State University, Pullman, WA 99163.

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P71. An Analysis of Emergency Medical Care Systems. Director, Cooperative Extension Service, West Virginia University, Morgantown, WV.

P72. Community Services for Nonmetropolitan People in the Northeast. John Kuehn, Dept. of Agricultural Economics, West Virginia University, Morgantown, WV.

P73. Sudden Industrialization of a Rural-Agricultural Region. Gene Summers, Dept. of Rural Sociology, University of Wisconsin, Madison, WI 53706.

a. Psychiatric Symptoms and the Use of Mental Health Services by Gene F. Summers, Working Paper RID69.6, Dept. of Rural Sociology, University of Wisconsin, Dec. 1969.

P74. The Economics of Institutional Arrangements for Viable Rural Communities in the Great Plains. Willard D. Schutz and R. R. Fletcher, Division of Agricultural Economics, University of Wyoming, Laramie, WY 82071.

a. Economic Costs of Providing Ambulance Services in Wyoming by Er-Hui Shu, Master's Thesis, May 1974.

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P75. Allison, Thaine H., "The Contribution of Health Facilities to Rural Economic Development: A Regional Analysis Approach", Paper presented at 1969 Meetings of the Western Agricultural Economics Association, Corvallis, OR.

P76. Bierman, Leland and Mark J. Powers, Ambulance Services in Northwest South Dakota, Bulletin 569, Agricultural Experiment Station, South Dakota State University, Apr. 1970.

P77. Brown, David L., "The Redistribution of Physicians and Dentists in Incorporated Places of the Upper Midwest, 1950-1970", Rural Sociology, Vol. 39, No. 2, Summer 1974, p. 205-223.

P78. Christenson, James A. and Vance E. Hamilton, Through Our Eyes: Rural-Urban Health Care in North Carolina, Misc. Extension Publication 115, Cooperative Extension Service, North Carolina State University, June 1974.

P79. Favero, Philip, Capitation and Group Practice as Health Care Alternatives, Special Paper No. 19, Dept. of Agricultural Economics, Michigan State University, Mar. 1974.

P80. Hardy, William E., J. Paxton Marshall, and J. Edwin Faris, "Determining Locations for Rural Medical Clinics: A Model and Its Use", Southern Journal of Agricultural Economics, Dec. 1973, p. 165-174.

P81. McCoy, John F., Bernal Green, and Mary Jo Grinstead, Sixty-Nine Percent of Arkansans Indicate Willingness to Use Services of Physician Extenders, AHSC Technical Reports, Vol. 4, Arkansas Health Statistics Center, Little Rock, AR, May 1974.

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P83. Napier, Ted L., "Mobile Service Centers: A Potential Mechanism for Small Rural Community Development", Journal of Community Development Society, Vol. 3, No. 1, Spring 1972, p. 56-63.

P84. Perkinson, Leon B., "Distance Traveled to Obtain Medical Services in a Selected Rural Area", Paper presented at 1974 Meetings of the American Agricultural Economics Association, Texas A&M University.

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RURAL HEALTH CARE RESEARCH:
PAST ACCOMPLISHMENTS AND FUTURE CHALLENGES

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Rural health research, both formal and informal, has multipled rapidly in the last several years. Stimulated by an apparent shortage of health care resources in rural areas, researchers have been presented with three basic questions: What are the impacts of health resource shortages in rural America? How can they be overcome or compensated? And who is responsible for, or capable of, resolving their inequities?

Surveying the rural health care research literature from 1945 to 1973, Sorenson reported a marked increase in studies for each of three categories: 1) health education, health care planning, and utilization; 2) epidemiology and morbidity, mortality, and health care; and 3) recruitment in education distribution of health care providers (1). Several bibliographies and reviews have appeared recently which provide ample descriptions of many of the activities to date (2,3). In addition, a number of programs have been developed which have the potential of generating, as a by-product, valuable information about the needs and potential solutions around rural health care delivery problems.

Research may be viewed as the organized gathering of information by which new knowledge is gained. Much of research in rural health has been in the form of innovations of different kinds with varying degrees of evaluation of its impact. We would propose to review such research under four headings: 1) the application of technology; 2) health manpower; 3) utilization of health care services: and 4) new patterns of health care delivery organizations.

TECHNOLOGY

Parks describes several programs developed or underway which have made major use of telemetry (4). The application of sophisticated systems, including those originally developed by NASA to monitor astronauts, are currently being tested on the Papago Indian Reservation (5). Communication

by means of satellite has been supported by a Lister Hill National Center for Biomedical Communications, a part of the National Library of Medicine. Satellite communication for both patient care support decisions and medical education is currently being tested in Alaska (6). An earlier study of satellite communications suggested that this technique might provide more reliable support for paramedical personnel in remote field station areas (7).

Several years ago Bodenheimer reviewed the applicability of mobile health vans as a solution to the rural health problem and concluded that these would not be appropriate in most cases (8). A large number of studies have been conducted on the feasibility of helicopters or fixed-wing aircraft transportation to assess their cost-effectiveness (9-13).

Although a great many plans have been written*, the amount of actual research data on emergency medical services (EMS) is relatively sparse. Waller has noted the inapplicability of urban data to rural EMS problems (14). Several studies have examined the best patterns of rural ambulance service at both the current and optimal levels (15-17). Several states have developed statewide networks for EMS based on a series of local trauma centers. The program in Illinois is a good example of this (18). At this time the evaluation data on the impact of such programs look at only gross measures (19).

A new technology which may facilitate rural planning is the introduction of location analysis. Computer programs have been developed to identify the most efficient locations for various services in order to minimize travel distances for the population to be served. Such a planning technique could be particularly appropriate for regional concepts of rural health care.

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*The interested reader may want to consult the compilation by H. Plass, D.C. Dodson, H. King, D.H. Pike, F.B. Shipley II, and G. Beal, "The Evaluation of Policy-Related Research in Emergency Medical Services: Volume I, A Selected and Critical Annotated Bibliography," University of Tennessee Bureau of Public Administration (mimeo), 1974.

HEALTH MANPOWER

A number of programs have been developed to provide non-physician primary care practitioners. Physician assistants and nurse practitioners have been used in a variety of rural settings (20,21). Perhaps the best-known nurse practitioner program is that operated by the Frontier Nursing Service (22,23). The Utah Valley Hospital is currently working under a Robert Wood Johnson Foundation grant to staff a series of communities with nurse practitioners supported by hospital-based physicians who visit periodically and communicate regularly. The Social Security Administration is currently conducting a major national study to test the effects of different methods of reimbursement for physician assistant services.

Among the physician assistant models, perhaps the most successful at meeting rural health care needs has been the MEDEX program (24). Lawrence and Wilson suggest that the Medex have been primarily placed in rural, scarcity areas to augment physician care. The postulate that the addition of a Medex to a physician's practice may facilitate retaining doctors in rural areas (25). Certainly there is a growing body of data to suggest that various types of non-physician primary care practitioners are well received by patients (26,27) and by at least some portion of the medical community (28).

The development of these new forms of health manpower has come about in response to the recognition of the increasing difficulty of recruiting and retaining physicians in rural practices (29,30). However, new data suggest that this is not always the case. For example, a study of Sears Roebuck Foundation's Community Medical Assistance Program suggests that those communities with a capacity to build a clinic were successful in

recruiting, and generally retaining, a physician (31). In contrast, the often-postulated idea that building a medical school will yield physicians for the area has not been borne out (32). Medical schools are now rediscovering the preceptorship as a means of inducing students to consider rural practice. The recent report by the Steinwalds would suggest that the effectiveness of the preceptorship programs has been minimal (33). Better results may be achieved by elective admission of students with a high likelihood to enter rural practice (34). The prime predictors of such students would appear to be rural origin of the student and, perhaps even more importantly, a rural origin for his wife (35).

The National Health Service Corps represents a potential laboratory to test a variety of different models for health care delivery as well as the effectiveness of such an experience in establishing positive attitudes toward rural practice in the minds of physicians. Several factors will, however, make it difficult to interpret the results of any follow-up studies of National Health Service Corps alumni. Particularly important is the elimination of the physician draft, which means that persons entering the Corps will represent a highly selected group who are already motivated toward this type of practice.

UTILIZATION OF HEALTH CARE RESOURCES

Several studies have documented the difference in utilization rates between rural and urban medical care consumers (36-42). There appears to be an urban/rural differential by which rural residents are less likely to utilize health resources. What is less clear is the value which should be attributed to this. Several authors have drawn a very sharp (and important)

distinction between the concepts of need and demand in talking about health care services (43). While the availability of services may increase their utilization, there is little evidence at present to suggest that this may be any more a response to need than it is a response to supply (44). A study comparing patterns of utilization services for consumer goods and health care suggests that one cannot always safely assume that these two patterns will overlap (45).

Roemer's review of the health status of rural dwellers suggests the synergism of poverty and rurality would decrease the utilization of physician services (46). At the same time we see a phenomenon of some urban dwellers seeking care in rural towns (47).

Looff has looked specifically at the mental health problems of rural Appalachia and the interaction of geography and culture (48). Since 1971 the National Safety Council has been conducting a continuous survey on farm accidents; fifteen states have been covered, and five more are scheduled this year.

HEALTH SERVICES DELIVERY ORGANIZATIONS

Allusion has already been made to the potential information to be gained by further examination of the National Health Service Corps. The plurality of models calls for actual experiments into both quality of care and effectiveness. Little work is available on the basis of total community impact, using a defined population as a denominator. This approach to health care delivery falls under the general rubric of health maintenance organizations. A recent census of these delivery systems suggests that

some 6 out of 50 programs operational at the end of 1974 are based in rural areas, with 17 HMOs among 135 total HMOs in some state of development (49).

In addition, a series of Family Health Centers have been developed in a variety of rural areas across the country. Work is currently underway to study the impact of these centers and to identify those factors of both center organization and community which might be useful in distinguishing successful from unsuccessful projects.

At a simpler organizational level, many rural hospitals have seen advantages in merging services or entire organizations. Although an appealing concept, to date the advantages of this grouping together have not been adequately documented (50).

UNANSWERED QUESTIONS

Although a great deal of effort has clearly been extended for a variety of active research programs in various aspects of rural health care delivery, perhaps more significant are the areas which have not been explored in any depth. Many questions have been asked about what kinds of programs can be brought to or developed in rural communities; we have been less clear on what kinds of communities can best undertake such programs themselves, or even be in a position to provide the necessary support (51,52). An agenda for important interdisciplinary research would then be to determine how much (in terms of money and effort) are communities willing to invest in order to get an adequate level of health care. The goal of such research would be to identify those factors in a community which would allow one to predict with reasonable success the potential of a community to work

successfully toward developing its own medical care system. Such research would require the collaborative efforts of sociologists, anthropologists, political scientists, economists, and the like. Although the problem has often been defined as eager communities versus reluctant doctors (53), it may be more appropriate to look within the communities to find out whether there is sufficient organizational and administrative talent to provide the necessary leadership to undertake the developmental activities necessary to attract and maintain the health care system. Too often a community may be highly motivated to find a physician only to stop short of establishing a total system once that individual has been identified. The pressure is released and the recruitment energies channeled in another direction, not to emerge again until the crisis rises once more.

Perhaps a more basic question is, who is responsible for delivering health care in rural areas? While we have almost universally come to accept the concept of medical care as a right in this country, it is rarely defined in operational terms which clearly indicate the extent to which medical services should be made available regardless of geographic accessibility. Precedence set by other social commodities are not helpful because they represent opposing philosophies, depending upon the specific issue. We have chosen to develop consolidated school systems to improve the quality of education at the cost of convenience, but we have also opted to preserve the R.F.D. mail system despite its inefficiencies. At this point in time medical care is not a public good to the same extent as either education or the mails, but it is assuredly a public concern and increasingly a public responsibility. We may soon have to choose between easier access to decentralized medical services and better quality through more centralization.

Nor have we clearly delineated where responsibility lies. To what extend do state medical schools have a responsibility for directly providing care in isolated areas? Particularly as the funding of medical education becomes increasingly a federal responsibility, the political and moral pressures on state schools may be expected to diminish. Moreover, one can readily say that their role is to provide appropriate manpower and that the efficiency of training such health professionals should not be compromised by requiring of them a service obligation as well.

One might question whether it is appropriate to look toward the community as a corporation to contract with providers from either the private or public sector to provide such services or whether the entrepreneurial, fee-for-service model is still the most appropriate. A variety of experimental opportunities exist. For example, to what extent can one move around existing hospital resources to convert the traditional inpatient service into a more comprehensive health care program? Some experimentation is already underway in this area. The State of Utah has established a program which permits hospital beds to be reclassified as extended care beds in order to improve utilization of rural hospitals. In a similar fashion, one might extend this concept to provide multiple layers of care from infirmary-type services through true hospitalizations within the same facility by using the support services for day care and ambulatory programs.

Almost twenty years ago Bridgman described a regional network of hospitals and clinics (54). We have begun to implement such a program in a few places but have measured its impact in virtually none.

McNerney and Ridel describe the difficulties of fostering inter-institutional collaboration and cooperation for more effective sharing of services in rural areas (55). Once again their efforts have been replicated to various degrees in different settings, but no adequate evaluation has been done.

The Indian Health Service represents a model of a federally funded centrally administered rural health care system which has been inadequately studied and evaluated (56).

As already noted, the National Health Service Corps represents another such opportunity to experiment with different models of care and assess their relative impacts.

Our thesis then is that although we have been very much caught up in the question of technology, be it either human or machine based, the fruitful area for research at this point may well be at the organizational level. There is a crying need for studies of impact which identify predictors of success at both the community and institutional level.

Although the possibilities of implementing pure experimental designs are likely to be limited by the exigencies of community demands, a variety of quasi-experimental designs are available (57). A particularly attractive model is the time-series analysis using archival data (58).

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ASSESSMENT OF KNOWLEDGE OF RURAL HEALTH: KNOWLEDGE NEEDS AND METHODS

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ASSESSMENT OF KNOWLEDGE OF RURAL HEALTH: KNOWLEDGE NEEDS AND METHODS*

Introduction

When Jim Hildreth invited me to participate on this program, both he and I expected there would have been completed by this time an assessment of knowledge on rural health. I regret to report that the materials transmitted to us by Control Data Corporation at the end of the contract period did not contain a knowledge assessment. Thus, I had to search for an alternative. My first try was to produce a paper characterizing the research done and underway in rural health from information contained in the CDC report. However, after summarizing that information and taking its limitations into account, I decided such a paper would not be useful to this forum. Instead, I have prepared a paper specifying some knowledge needs for guiding a knowledge assessment of rural health, accompanied by a brief statement on methods. We still need the knowledge assessment as much as we did a year ago, and this forum seems to be a proper place to seek suggestions or assistance. So, here are the results of my effort to specify a knowledge assessment on rural health relevant to USDA policy analysis and decisions.

What Is a Knowledge Assessment?

To "assess" is to estimate the value of something. An "assessment" is a process in carrying out and completing an estimate of value.

*Suggestions by Bill Carlson and John Fedkiw, Office of Planning and Evaluation, were incorporated in this paper.

These terms are commonly used in taxation literature where assessments of property are made for purposes of fixing amounts of property taxes. The terms are new in scientific literature, although the processes are not. In knowledge assessments we are estimating the worth of a specified domain of knowledge for specified purposes (policy-making, program management, research administration, etc.).

The key to any knowledge assessment is the specified purpose--that purpose provides the scope and criteria for the assessment. To attempt an assessment without a purpose is like trying to carry out research without a problem, or to steer a ship without a rudder. There can be a large number of purposes of knowledge assessments on rural health. Each would provide a basis for an independent assessment of the same body of literature. The purpose of our desired assessment of rural health is to estimate the worth of the literature and research for use in USDA policy analysis and decisions. A first step, therefore, in our desired knowledge assessment is to identify the specific knowledge needs of our policy officials. But first, let me digress briefly to state why USDA policy officials have needs for knowledge about rural health.

Why USDA Needs a Knowledge Assessment of Rural Health

USDA interest in rural health policy-making and administration arises mainly from Title IX of the Agricultural Act of 1970, and the Rural Development Act of 1972 (especially Sections 104, 118, and 603).

Title IX of the 1970 Agricultural Act expressed a Congressional commitment to rural-urban balance as a national policy, and thrust

upon the Department of Agriculture and the Administration responsibility for reporting periodically to the Congress on a number of subjects relating to that policy. The several reporting requirements of major significance for this paper were on the availability of government or government-assisted services to rural areas, including medical services, and efforts of the Executive Branch to improve these services during the immediately preceding fiscal year. The reports to the Congress in response to this legislation indicate Federal health program services, as well as many other Federal program services, are urban oriented in their application. For example, the third annual report on government and government-assisted services to rural areas indicated that 20 percent of the health manpower program outlays in FY 1972, and 14 percent of the Federal support of health facilities construction in the same period, were applicable to rural areas. The rural (nonmetro) areas contained about 32 percent of the total population in 1972. This type of comparison implicitly assumes that the per capita shares of Federal health program services should be the same for rural as for urban people. This concept of "parity" underlies Congressional pressure on USDA (not DHEW) to obtain a better deal for rural people in Federal health program services.

The Rural Development Act of 1972 made the Secretary of Agriculture the Federal spokesman for the rural interests. Section 603 of the Act directs the Secretary to coordinate all Federal assistance with State and local efforts in rural development. The Congress considers health programs to be a component of Federal assistance in rural

development. The recent quarterly "oversight hearings" by the Senate Subcommittee on rural development placed a great deal of emphasis on rural health. The newly enacted Comprehensive Health Planning Act (1974) was one of the subjects of interest to the Members of that Subcommittee. The Senators also wanted to know if USDA was staffing up with medical expertise.

Two loan programs authorized by the RD Act involve USDA in development of health facilities in rural areas--loans to public bodies for essential community facilities (Section 104) and loans to private entrepreneurs for business and industrial development (Section 118). FmHA has made loans for developing health facilities under both authorities. The agency, as well as USDA policy officials, need to know whether, or to what extent, health facilities and services affect levels and rates of rural economic and social progress.

USDA is directly involved in National health policy and program development and implementation. In addition to the coordination authority of the Secretary, the Congress involves USDA in evaluating legislative proposals for National health policy and programs.

It is not known whether the knowledge base on rural health is adequate for the types of policy analyses and decisions required in the health aspects of rural development. This is why a knowledge assessment on rural health is needed. The USDA rural health knowledge needs

for policy analysis and decisions are specified in some detail in the section to follow.[1/]

Specific Knowledge Needs

I shall organize the discussion of specific knowledge needs by the following general questions:

-- What are the rural health problems, if any?

-- Are the statistical data adequate to properly characterize the various factual dimensions of rural health services and conditions.

-- What impacts do the problems have on rural development?

-- What progress (if any) is being made in solving the problems?

-- What are the respective roles of Federal, State, local and private efforts in improving rural health services?

-- Does ongoing research hold promise of alleviating the major deficiencies in knowledge for policy analyses and decisions?

This is not intended to be an exhaustive list of relevant knowledge need categories--rather it could be considered a starting set of issues for a knowledge assessment, and more detailed specifications of the issues could be added as the assessment proceeded.

1/ My judgment of the specific rural health knowledge needs of USDA policy officials is based upon the types of decisions being made, or anticipated, and the knowledge input requirements for properly analyzing the policy options prior to making those decisions.

Rural Health Problem

Many, perhaps most, health problems are common to both rural and urban people, although the severity or incidence may differ. A USDA policy official would feel more justified in getting involved in national health policy-making if he knew whether there was anything unique about rural health problems, and, if so, what it is. Statistics abound showing shortfalls in rural health facilities and services, as compared with urban areas. But these are results--What are the causes? Has research dug deeply enough into this matter to adequately explain the observed facts? A variable such as income might show-up highly significant in this explanation, but low income is not something uniquely rural. Urban poverty areas may also be medically deprived areas. If a higher incidence of poverty in rural areas explained much of the situation, the proper approach to solving the rural health problem might be to increase rural per capita income rather than to try attacking the health situation directly. Population sparsity may be a significant factor. Has anyone tested the hypothesis that population sparsity is consistently related to poor health facilities and services in rural areas? Are there important exceptions? What explains any existing exceptions? Could the "rural health problem" be related to past comparative advantages in health facility location, and a lag in adjustment in relation to present locational advantages? Has anyone really explained the geographical pattern in health facility and service location? What are the price and income elasticities of demand for health services by rural and urban people? Do "trade-offs" between

efficiency and equity in the delivery of Federal health program services to rural people contribute to the problem? What would be the costs and benefits of achieving full "equity" or "parity" in health program services delivered to rural people?

Statistical Dimensions of the Rural Health Conditions

The foundation for policy analysis is relevant facts. Do the various Federal, State, or other health statistics properly characterize rural health services, problems and trends of relevance? Most health statistical series were initiated years ago, and without reference to the specific purpose of quantitatively measuring the various aspects of rural health situations. Do these statistical reports reflect changes in health attributes of populations, changes in specific health service availabilities, the various components of health service costs in different geographical locations, or measures we can associate with quality of medical services? The reliability of the available data also is an attribute of interest. Most researchers shy away from investigations of data availabilities and reliabilities per se, yet this could be one of the most important of the various rural health research needs.

Impact of the Problem on Rural Development

The proposition that poor rural health facilities or services impedes progress in rural development is taken for granted by most public officials with interest in rural development. Has this proposition ever been subjected to a rigorous test? To what extent is health conditions

a factor in industry location in rural areas? Do rural health conditions consistently improve following rural industrialization? If not, what explains any lack of improvement? The idea that the absence of a causal relation between rural health and rural development would justify any lack of USDA interest in rural health is not intended to be implied by these questions. One could justify a USDA interest in rural health on ethical or equity grounds, independently of any economic or rural development considerations. The significance of the questions raised is based upon judgment that the authority of the Secretary to coordinate Federal programs is limited to rural development purposes rather than enhancing rural well-being in general. The Federal responsibilities for administering national health policies and programs are delegated to the Secretary of DHEW, not the Secretary of Agriculture. Therefore, the posture of the Department in relations with DHEW health program managers would be stronger with evidence in hand that there is a positive contribution of rural health improvement to rural development.

Progress in Solving the Problem

A basic policy issue is, what determines the rates and amounts of progress in improving rural health conditions? Trends can be both encouraging and deceiving. An example is a graph showing per capita personal income increasing at higher percentage rates for rural than for urban people, while the absolute dollar gap widens. I have a hypothesis that medical technology associated with increase in quality of health services increases much faster in urban than in rural areas. Associated with this hypothesis

is a proposition that medical technological advance in rural areas is a spill-over from urban areas, and with some considerable lag in full coverage of rural areas. If this hypothesis is correct, much progress in improving rural health conditions will be necessary just to keep from falling further behind the level and quality of urban health services. Do we know whether our progress in improving rural health conditions is sufficient to justify a belief that we're closing the gap? Or, are we running farther behind with each passing year? It is possible that different kinds of rural areas differ significantly in respect to percentage and absolute rates of progress when compared with urban areas. Is there research literature on this subject? I am not aware of any.

Federal, State, Local and Private Initiative and Responsibility

The various conceptions of the role of the Federal government in local or private affairs creates a need for research based knowledge on what is, or was, or could be the Federal role in efforts to improve rural health conditions. A New Federalist would like to see research results indicating local and private initiatives can solve, or are solving, the rural health problem. On the other hand, the Old Federalist would expect research to show that local and private initiatives are insufficient for accomplishing the desired improvements. USDA's current position is that the primary purpose of Federal efforts in rural development is to help rural people help themselves. Do rural communities attempt to solve their health problems by "kicking the problem upstairs" (shift responsibility to States)? In turn, do States merely transfer their rural

community health problems to the Federal government? If this process exists, what explains it? Are State, local and private initiatives in health being dampened by Federal activity and "promises"? Studies in political science need review for these kinds of issues. Studies of State and local comprehensive health planning, and associated actions, also may be of relevance in understanding the extent to which State and sub-State districts take initiative and responsibility in solving rural health problems. Is the thrust of comprehensive planning toward developing a "wish-list" for Federal aid, or is it oriented to other purposes? What are the purposes of comprehensive planning?

Prospects for Alleviating Knowledge Deficiencies

After a knowledge assessment relevant to the above discussed issues has been completed, the results would be useful in appraising ongoing rural health research. Are the major knowledge deficiencies (if any) being addressed in ongoing research? No knowledge assessment would be complete without taking that additional step. A possible action by policy officials could be to encourage research on specific issues of relevance to policy analyses or decisions.

Methods for Knowledge Assessments

The appropriate method for carrying out knowledge assessments is not stressed in methodology textbooks. No statistical sampling or tests are involved. Models and computer routines are unnecessary. It is the oldest and still most used of our research methods: library

research -- procedures so well understood by researchers that we take them for granted. We have a knowledge need, and we review the literature (generally in libraries) in search of a fulfillment of that need. That's the knowledge assessment process.

The simplest forms of knowledge assessments are made by researchers who identify problems, assess extent to which available knowledge resolves the problems, and identifies unanswered questions on the subject as justification for research to answer the "unanswered questions". PhD students do the same thing for Chapter 2 of their theses--review of the literature. Those students are not told how to do library research--it is taken for granted that they know how.

A knowledge assessment of the magnitude required to deal with the needs expressed above does require procedures more complex than required by the PhD student. Instead of one library, the Nation's libraries comprise the research site. One has to find efficient and workable ways to screen literature in all those locations without actually physically searching the literature in each and every library. There are information centers that help. And there are experts in rural health who can be helpful. One has to be careful, though, that the experts do not set us to work on their problems, and thereby divert us from ours.

A consoling feature of the task is that not all literature in rural health has to be reviewed in-depth to adequately deal with the issues of interest to USDA policy officials. Much of the irrelevant literature can be identified from the titles of articles or publications. The boundaries

of literature that needs to be reviewed in-depth are set by the limits of the subject-matter implied by the knowledge needs.

The most difficult challenge and crucial aspect of a knowledge assessment is not gaining access to the relevant literature, but rather the actual evaluation of aspects of that literature relating to policy-relevant issues. The "reliability of the literature" is at issue. Are the research results reliable? Much subjective judgment has to enter into these processes.

The knowledge assessment report can range from a literature review comparable to Chapter 2 in that PhD student's thesis, or something as comprehensive as a textbook. For a report on aspects of rural health of interest to USDA policy officials, something between these extremes would seem to be appropriate.

Conclusion

I have described a prospectus for only one knowledge assessment. There could be many other assessments of knowledge about rural health, each defined in relation to a specific set of related knowledge needs. Obviously, we do not need all those possible knowledge assessments that could be made on rural health. In my view, knowledge assessments of rural health should be limited to those that can be justified on the basis of worthy public purposes or needs.

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